Prevalence of Proteinuria among Hypertensive Patients in Khartoum State

ABSTRACT

Background:

Hypertension defines as a rise in persistent force per unit area with heartbeat one hundred forty mmHg and pulse pulse ninety mmHg. Prevalence of cardiovascular disease is calculable to be 27.6%. Cardiovascular disease in Sudanese people was related to high sugar and salt intake, fat and increase in age. Reduction of each sugar and salt intake is a very important and efficient method for reducing cardiovascular disease and also the risk of cardiovascular diseases (CVDs) and will be advocated by the health authorities and also the public in Sudan.

Uncontrolled cardiovascular disease ends up in organ injury, inflicting strokes, heart attacks, retinopathy, or excretory organ disorders. The presence of macromolecule in body waste will be a marker of excretory organ abnormality.

Aim: the present study was amid to assess the prevalence of Proteinuria in hypertensive Sudanese patients in Khartoum state.

Methods: This is a descriptive-analytic cross-sectional study was conducted using a total sampling of 50 in hypertensive Sudanese patients. Samples were examined their blood pressure and urine of by cobas c311 systems. The data was collected by questionnaire, then analyzed by computer using SPSS version 23.

Results: most of the participant 52% of was male and 48% were female. most of participant presented among age 35-45 years, majority of them had secondary level of education, and most of them were married ,most of them had duration of hypertension more than 10 years and had DM as other disease with hypertension, There was insignificant association between age group and Proteinuria (P.value was 0.343) , insignificant association between gender and Proteinuria (P.value was 0.546) ,insignificant association between other disease and Proteinuria (P.value was 0.373) and There was significant association between duration of disease and Proteinuria (P.value was 0.001).

Conclusion: we find that there was a significant relationship between blood pressure and Proteinuria examination results.

Key words: Proteinuria, hypertension, blood pressure, kidney disorders

1. Introduction:

"New definition of hypertension is increase blood pressure to 140 mmHg or more and diastolic blood pressure more than 80 mmHg. Prevue's studies suggest that most cases of hypertension are idiopathic (also known as essential hypertension) and it may complication of other disease (named secondary). More than 1,000,000 adults in a world have hypertension with up to 45% of adult populations was being affected with disease and the prevalence rises with age consider for up to 60% of population above 60 years old". [1] "Hypertension is one of the most important risk factor for death-rate worldwide. Epidemiological studies have reported that hypertension is associated with the peril of coronary heart disease, cerebrovascular disease and chronic renal disease. However, there leftover a lack of grasp of the determinants of hypertension" [2].

"Chronic renal disease is constant renal damage accompanied by relief in the glomerular filtration rate (GFR) and the existence of albuminuria. In 2009, more than 57000 people in U.S were assorted as having end stage renal disease (ESRD). The rise in overthrow of CKD is attributed to an aging multitude and increases in HTN, diabetes and obesity. It is associated with electrolyte imbalance, mineral and bone disorder, anemia, dyslipidemia and hypertension. Hypertension occurs in 85%to 95% of patients with CKD (stage 3_5). Uncontrolled hypertension is risk factor for developing CKD and rapid progression of CKD" [1].

"Microalbuminuria is an indicator and soothsayer of early renal disease, sign of vascular dysfunction and predictor for morbidity and mortality of cardiovascular disease (CVD). The propagation increase with disease duration. Some studies found that microalbuminuria linked to the risk of hypertension whereas others suggest higher blood pressure predicted further risks of microalbuminuria". [3] "In study done by Mani (2016) in rustic Africans to study albuminuria in hypertensive patients, found that the prevalence of Proteinuria is about 40% in untreated hypertensive population and about 25% during hypertensive patients treated with β- blockers. The prevalence increase with age, duration and severity of hypertension". [4]

1.1. Proteinuria:

"The term Proteinuria refers to presence of comparatively of protein in urine 30- 300mg/day which below the revelation threshold of standard urine dipstick test. Now defined as urine Protein secretion between 20 and 200 µg/min or 30-300mg in overnight or 24-h urine gathering. The importance of Proteinuria as an independent predictor of progressive kidney disease and

cardiovascular mortality was thereafter realized in number of prospective and epidemiological studies especially in patients with diabetes and hypertension". [5]

1.2. Epdimyology

The epidemiological studies suggest that secretion of as little as 10 mg/day of protein in the urine is associated with increased risk of kidney failure. There are several methods for assessing protein or albumin excretion in the urine including the spot the ratio of protein /creatinine in urine. the urine dipstick and the 24 h urine collection. Of these, the 24 h urine collection is considered to be the gold standard. Proteinuria may be transient or persistent. While transient proteinuria is almost always benign, persistent proteinuria may be due to several different causes including primary glomerular diseases and systemic disorders that damage the kidneys [6].

1.2. Causes of Proteinuria:

"Elevations concentration of protein in the urine may be refer to: flaw in perm-selectivity of the glomerular filtration partition to plasma proteins (glomerulonephritis or nephrotic syndrome), deficient in tubular reabsorption of proteins (interstitial nephritis), increased plasma intensity of proteins (multiple myeloma-Bence Jones protein, myoglobinuria) and urinary tract inflammation or tumor".[7] "most likely cause for protein in hypertensive are changes in hemodynamic that cause an increased in intra-glomerular pressure and a generalized angiopathy due to endothelial dysfunction that cause kidney and systemic trans-vascular albumin leakage".[8]

2. Materials and Methods

This is an experimental case –control hospital based study. Study was done on Sudanese hypertensive patients; include 50 Sudanese hypertensive patients attending to the hospital regulatory for continuation from different regions of Khartoum state. Data was collected by using structured questionnaire specially designed for this research. Urine sample was collected for protein analysis [9]

2.1. Sampling managements:

The cases were selected neatly. Urine was collected with care and sufficient safety precaution to ensure test results are reliable. Quality assurance and standard operative system was followed for all biochemical tests to realize validity and reliability of test results.

2.2. Collection of samples:

Sterile urine containers were used for spot urine sample collection to measure the quantity of total protein.

2.3. Data analysis:

The average, standard deviation (SD), and the correlations between albumin age, period of hypertension, DM with hypertension and controlled of hypertension. For all statistical comparisons a P-value was considered statistical significant. All statistical procedures were performed using SPSS software, version 22.

3. Results:

Result of the study was presents in tables 1 – 4. According to the study, the amount of protein appearance in urine was more in females than in men, but this increase is not statistically significant, P.value .546 (table one).

The relationship between age group and proteinuria was higher in the age group between 35 to 45 years, followed by the group above 65 years, while the group between 46 to 55 years was the lowest (table two). 23 of the study participants had a mean duration of illness between 5 to 10 years (table 3), 28 from the patients also suffering from diabetes (table 4).

Table 1: Correlation between gender and Proteinuria among study population (total sample *n*=50)

Gender	**Proteinuria**			**P.value**
	>300 mg/dl	<300 mg/dl	Total	
Male	16	8	24	**.546**
Female	18	8	26	
Total	34	16	50	

Table 2: Correlation between age group and Proteinuria among study population (total sample *n*=50)

Age group	**Proteinuria**	**P.value**

	>300 mg/dl	<300 mg/dl	Total	
35-45	13	8	21	**.343**
46-55	7	1	8	
56-65	8	2	10	
more than 65	6	5	11	
Total	34	16	50	

Table 3: correlation between Duration of disease and Proteinuria among study population (total sample *n*=50)

Duration of disease / year	**Proteinuria**			**P.value**
	>300 mg/dl	<300 mg/dl	Total	
less than 5	13	0	13	**.001**
5-10	17	6	23	
more than 10	4	10	14	
Total	34	16	50	

Table 4: correlation between present of diabetes and Proteinuria among study population (total sample *n*=50)

Present of	**Proteinuria**	**P.value**

diabetes				
	>300 mg/dl	<300 mg/dl	Total	
Yes	18	10	28	**.373**
No	16	6	22	
Total	34	16	50	

4. Discussion

"Hypertension and Proteinuria exist in most patients with chronic renal disease and are the risk factors for faster advancement of renal disease" [10]. "The high blood pressure case causes the injury of the kidney blood vessels. The constantly high blood pressure will cause progressive decay of the vessel structures that form the filtration system. The vessel structure's damage will cause changes in the glomerular filtration system, failure of protein reabsorption in tubules, and protein filtration that exceeds the tubules' reabsorption ability. All of those mechanisms will lead to kidney damage and causing Proteinuria" [11]. "Uncontrolled hypertension could affect our vascular system and result in target organ injury, both in macrovascular and microvascular. One of the macrovascular tangles is renal failure. Renal failure is remarkable by the turnout of protein or Proteinuria. Proteinuria is defined as the presence of protein elevated than the normal border, which are about 150mg/24 hours in adults and 140mg/m3 in children". [7] "In a normal case, protein should be present in urine in a trace amount about less than 10 mg/dl. In this study, we found a significant relationship between elevation blood pressure with protein urine. Continually high blood pressure could induce barotraumas in the blood vessel and cytokine activation that led to blood vessel defects in the long term". [11]

In the current study most of participant presented among age 35-45 years, 52% of them were male and 48% were female, majority of them had secondary level of education, and most of them were married, and also most of them had duration of hypertension more than 10 years and had DM as other disease with hypertension. There was significant different between duration of disease and Proteinuria (P.value was 0.000), these findings agree with Riska et al., [12]. Results of this study in conformity in several studies, such as the study by Agarwal et al., [13] that "propose patients with 300 mg/dl and more or utmost Proteinuria should arouse not only the appropriate assessment of Proteinuria. The grade of Proteinuria is correlated with systolic and

diastolic blood pressure without effect from glomerular filtration rate". This is harmonious with our findings that found there is a relationship between high blood pressure with Proteinuria as well as other parameters [14]. The variations in the prevalence rate of Proteinuria can be attributed to differences in many factors such as; study design, study population, diagnostic criteria, as well as the methods of measurement of Proteinuria and urine collection, and presence of hypertension. The high propagation of albuminuria in patients with hypertension is attributed to the existence of hypertension many years before it is actually diagnosed .in this study population, age, gender, other disease and education were not observed to be significantly associated with Proteinuria. It seems that age is not significant and what is important is the period of hypertension [15].In the present study 68 % had Proteinuria high that similar to study which reported participants who had both hypertensions, 77% had Proteinuria. [16]Participants aged older than 35-45 years had higher Proteinuria than other age class, another harmonization to study presented by Tannor et al., [17]. Our results and the results of a recent meta-analysis showed there is no link between an individual's and the presence of hypertension [18]. In the current study, there was no significant associations between hypertension and the marital status, education level; no significant associations were found between hypertension and the marital status, education level, in Uganda[19].

5. Conclusion

Finally we find that 52% of the participant were male and 48% were female was affected ,most of participant presented among age 35-45 years ,the majority of them had secondary level of education, and most of them were married. There was insignificant association between age group and Proteinuria (P.value was 0.343), gender and Proteinuria (P.value was 0.546).

Ethical Approval:

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

Consent

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

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